

PATENT ABSTRACTS OF JAPAN

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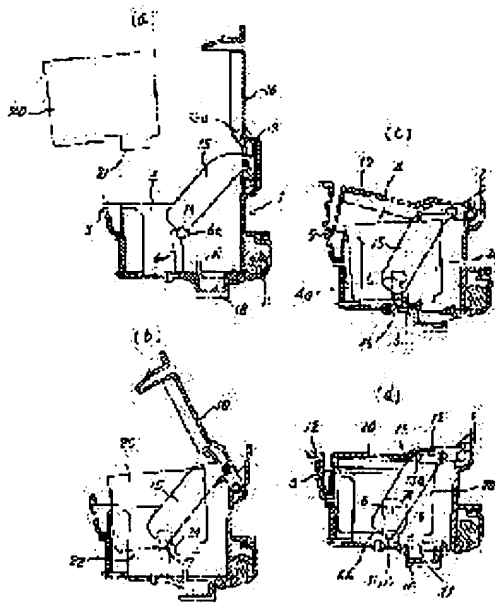
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**(54) INK CARTRIDGE AND LOADING MECHANISM THEREOF**

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink cartridge, which can be correctly loaded to a cartridge loading member, and its loading mechanism.

SOLUTION: By closing a lid body 10 under the condition that a lifter 15 is guided by a guide groove 6 parallel to the axis center of an ink feeding needle after a supporting rod 17 is engaged with a recessed part 24 provided on the under surface of an ink cartridge 20, the ink cartridge 20 is lowered precisely towards a recording head 18 so as to precisely install the ink feeding needle 19 without being damaged.



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3. In the drawings, any words are not translated.

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**CLAIMS**

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[Claim(s)]

[Claim 1] The ink cartridge characterized by putting side by side the crevice combined with a part of lifter member with an ink feed hopper on the inferior surface of tongue of an ink cartridge body.

[Claim 2] The ink cartridge according to claim 1 characterized by forming the above-mentioned crevice in the die length which reaches the both-sides side of the above-mentioned ink cartridge body.

[Claim 3] The ink cartridge according to claim 1 characterized by forming the above-mentioned crevice so that it may project inside an ink cartridge body.

[Claim 4] While establishing the interior of a proposal which extends in the sense parallel to the axial center of the above-mentioned ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back To the lid attached in opening of the above-mentioned cartridge loading member in good rotation The feeder style of the ink cartridge characterized by preparing \*\*\*\* which supports pivotably the lifter member which is guided inside the above-mentioned proposal and displaces the free end, engages with the crevice established in the inferior surface of tongue of an ink cartridge at the free edge of this lifter member, and supports this ink cartridge.

[Claim 5] The feeder style of the ink cartridge according to claim 4 characterized by preparing the press section which turns to the above-mentioned ink supply needle the ink feed hopper prepared in the inferior surface of tongue of this ink cartridge in contact with the top face of the above-mentioned ink cartridge just before the closedown, and presses it to the inside of the above-mentioned lid possible [ elastic deformation ].

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge which has the description to the loading nature to the ink jet printer of a serial type, and its feeder style.

[0002]

[Description of the Prior Art] The loading nature to carriage is [ how ] scrupulous, and there is no ink cartridge used for the ink jet printer of a serial type, and it may make an ink feed hopper have to agree correctly in the ink supply needle which projects from the tooth back of a

recording head.

[0003] By carrying out rotation actuation of the lever, making the engagement projection projected to the medial surface engage with the engagement slot of an ink cartridge side face, this is turned to a recording head and the feeder style of the carriage which the basis of such a technical problem was shown at JP,7-32049,Y pushes it in.

[0004] However, at such feeder guard, on the relation which an engagement projection rotates to the circumference of the supporting point with a lever, as a result of the component of a force of a recording head and the right-angled sense acting on an ink cartridge by friction with an engagement projection, un-arranging of making this supply needle projected at the recording head tooth back according to this component of a force break arises.

[0005]

[Problem(s) to be Solved by the Invention] This invention was made in view of such a problem, and the place made into the purpose is to offer the new ink cartridge which can make the sense parallel to the axial center of an ink supply needle insert [ ink cartridge ] correctly on the occasion of \*\*\*\*, and its feeder style.

[0006]

[Means for Solving the Problem] namely, this invention as an ink cartridge for attaining such a technical problem The crevice combined with a part of lifter member is put side by side on the inferior surface of tongue of an ink cartridge body with an ink feed hopper. As a feeder style of this ink cartridge While establishing the interior of a proposal which extends in the sense parallel to the axial center of an ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back The lifter member which is guided inside a proposal and displaces the free end to the lid attached in opening of a cartridge loading member in good rotation is supported pivotably. \*\*\*\* which engages with the crevice established in the inferior surface of tongue of an ink cartridge, and supports an ink cartridge is prepared in the free edge of this lifter member.

[0007]

[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 thru/or drawing 3 show one example of this invention about the feeder style which loads the carriage for color printers with an ink cartridge.

[0008] In drawing, a sign 1 is the carriage which served as the loading member of the ink cartridge shows around at a guide rod 2 and it runs to a scanning direction. This carriage 1 It is constituted so that it can load with two ink cartridges, the object for black ink, and the object for color ink. Where the ink supply needle 19 is made to project to the inner direction, the recording head 18 is attached in the inner inner side 3 of these cartridge loading sections, i.e., the insertion-and-detachment opening 4 of an ink cartridge 20 and the field of the opposite side, free [ adjustment ].

[0009] By \*\*\*\*\* 6a which the guide slot 6 which shows this carriage 1 to the lower limit of the lifter 15 later mentioned on the side face of each insertion-and-detachment opening 4 is formed, and was formed in that upper limit While enabling it to hold a lid 10 to an open position through a lifter 15, it is constituted so that an ink cartridge 20 may be turned to a recording head 18 and you may make it go up and down perpendicularly by vertical section 6b of the sense parallel to the axial center of the ink supply needle 19 formed in half the bottom.

[0010] The lid 10 which rotates the supporting-point pin 11 as a core to the upper limit of the guide rod 2 approach of the insertion-and-detachment opening 4 is supported pivotably by this carriage 1, and by making the piece 12 of a pawl of the shape of a cross section of U characters

formed in this free edge in one engage and release the stop section 5 prepared in the side besides the carriage insertion-and-detachment opening 4, it is constituted so that a lid 10 may be opened and closed.

[0011] The piece 13 of cartridge press of the shape of a support-at-one-end stain formed by leaving one side by the side of the supporting-point pin 11 to this lid 10, and separating other three sides from a lid 10 to it is formed in one. By pressing against the top face of an ink cartridge 20 the free edge 13a projected downward where a lid 1 is stopped It is constituted so that it can keep putting the ink supply needle 19 by the side of a recording head 18 to the ink feed hopper 21 prepared in the inferior surface of tongue 22 of a cartridge 20.

[0012] Moreover, it is supported pivotably free [ rotation of the end face of a lifter 15 ] by the part which approached free one end a little rather than the supporting-point pin 11 at this lid 10. moreover, the projected part 16 which protruded on the other end of this lifter 15 being constituted so that it may slide on the inside of the guide slot 6 mentioned above, and, where a lid 10 is opened wide until full Where it stopped the lid 10 in the location by \*\*\*\*\* 6a of guide slot 6 upper limit and a lid 10 is rotated to the location in front of a closedown It is constituted by vertical section 6b of the sense parallel to the direction of an axial center of the ink supply needle 19 so that the ink cartridge 20 on a lifter 15 may be perpendicularly dropped to up to a recording head 18.

[0013] In addition, the signs 7 and 7 in drawing show the lever for include-angle adjustment which carries out rotation adjustment to the circumference of the supporting point which does not illustrate each recording head 18 of a color and black, and the sign 8 shows the lever for nozzle justification which justifies the recording head of a color in the direction of paper feed on the basis of the black recording head 18.

[0014] Drawing 4 thru/or drawing 6 are what showed the ink cartridge with which this carriage 1 is equipped. By the way, this ink cartridge 20 In order to compensate the reinforcement, while it is formed as a container of closing in of synthetic-resin material so that as many ink as possible can be held, and forming the opening edge 23 thickly While projecting to the up-and-down sense, forming a rib 25 in the corner of the lateral surface and planning the \*\* form of the depth direction, it is constituted so that friction in the case of wearing may be made small.

[0015] The ink feed hopper 21 is projected and formed in the longitudinal direction end of that inferior surface of tongue 22, and by thrusting the ink supply needle 6 into the film which is closing that end face, it is constituted by this ink cartridge 20 so that a free passage with the ink feed hopper 21 and a recording head 5 may be aimed at.

[0016] In the inferior surface of tongue 22 of this ink cartridge 20 Only by the crevice 24 which makes the groove of the die length which reaches a both-sides side into the part which \*\*\*\*(ed) to that ink feed hopper 21 side being formed, and dropping this ink cartridge 20 into the insertion-and-detachment opening 4 The secondary cross-section multiplier of an inferior surface of tongue 22 is made with size by forming this crevice 24 so that engagement to \*\*\*\* 16 of a rib 15 can be aimed at. When it is constituted so that the reinforcement of the cross direction of an ink cartridge 20 may be raised more, and also this ink cartridge 20 is vacuum-packed, as shown in drawing 6 by making the packing material 26 enter until elasticity limit full in a crevice 24 Even when air enters the interior, as the two-dot chain line showed, it should be constituted so that the buffer ability which can maintain internal negative pressure as much as possible according to the force of the packing material 26 which it is going to restore out of a crevice 24 may be given.

[0017] Moreover, by on the other hand, forming so that this crevice 24 may be made to project

inside an ink cartridge 20 It cooperates with the rib 28 of lid 27 inside which formed the ink feed hopper 21 side highly. The air bubbles of the porosity elastic material 29 enclosed with the interior are gradually made small to ink feed hopper 21 approach, the meniscus of this part is made greatly, when internal ink decreases in number, these is collected to the ink feed hopper 21 side, and it is constituted so that ink can all be used.

[0018] Thus, in the constituted example, in order to load carriage 1 with an ink cartridge 20 now, as shown in drawing 2 (a), a lid 10 is opened first, the projected part 16 of lifter 15 lower limit is stopped to \*\*\*\*\* 6a of the guide slot 6, a lid 10 is held to an open position, the sense is set that the ink feed hopper 21 faces the ink supply needle 19 on it, and an ink cartridge 20 is dropped into the insertion-and-detachment opening 4 of carriage 1.

[0019] Thereby, as shown in drawing 2 (b), the \*\*\*\*\* beam crevice 24 engages with the ink feed hopper 21 side at \*\*\*\* 17 of a lifter 15, and in the ink feed hopper 21, an ink cartridge 20 turns the heavier one of the opposite side down, and is held with the posture which inclined in the counterclockwise rotation in drawing.

[0020] When a lid 10 is shut in this condition, as shown in drawing 2 (c), and an ink cartridge 20 It descends to the interior, being led to insertion-and-detachment opening inside 4a of stop section 5 approach. Subsequently If the projected part 16 of lifter 15 lower limit reaches vertical section 6a of half the bottom of the guide slot 6 and \*\*\*\* 17 comes to descend perpendicularly, an ink cartridge 20 will change the posture into the level sense gradually, using the inside 4a upper limit by the side of the stop section as the supporting point.

[0021] And finally, if the projected part 16 of lifter 15 lower limit approaches the lower limit of the guide slot 6, as shown in drawing 2 (d) A cartridge 20 is dropped the piece 13 of a spring of the shape of a cantilever prepared in the lid 10 pressing a top face from a top by the point 13a. Penetrating of this is carried out to the ink feed hopper 21, tearing a film with the ink supply needle 19 located in right under [ the ], and the free passage unification of a recording head 18 and the ink cartridge 20 is carried out.

[0022] On the other hand, when the ink in an ink cartridge 20 needs to be lost by long-term record writing and the new ink cartridge 20 needs to be exchanged, the piece 12 of a pawl is pushed and a lid 10 is removed from the stop section 5.

[0023] Thereby, since the lid 10 has bounded upwards by the spring nature which the piece 13 of a spring has, if this is opened further, the projected part 16 guided at vertical section 6b of the guide slot 6 pushes up an ink cartridge 20 right above with a posture as it is with a lifter 15, it will make it secede from the ink feed hopper 21 after this, without making the ink supply needle 19 break, and will make drawing of an ink cartridge 20 possible.

[0024] Therefore, after raising an ink cartridge 20 also as that of the insertion-and-detachment opening 4 through the reverse of the actuation mentioned above to (a) from (c) of drawing 2 , it inserts and takes out henceforth with a finger.

[0025] On the other hand, since an ink cartridge 20 is \*\*\*\*\* (ed) while the ink cartridge 20 has been in the condition that a crevice 24 does not engage with \*\*\*\* 17 of a lifter 10 as it was shown in drawing 3 sense [ reverse ], i.e., when dropped with the posture in which the ink feed hopper 21 and the ink supply needle 19 do not face each other, the ink feed hopper 21 will touch base 4b first.

[0026] However, a user makes this unusual loading condition immediately known in this condition, without being interfered at this top face, it becoming impossible for a lid 10 to stop above, and press of an ink cartridge 20 also serving as impossible at coincidence, and producing breakage of the ink supply needle 19 by impossible press fit, since the top face of an ink

cartridge 20 has still projected above the insertion-and-detachment opening 4.

[0027] By the way, although the example about the ink cartridge with which the carriage for color printers is loaded, and its feeder style explains this invention, to say nothing of this invention being applicable also to the printer for monochrome, the above can load the 1 side of the body of a printer, or both sides with an ink cartridge, and can install, and can apply this invention to the printer of a format.

[0028]

[Effect of the Invention] Since the crevice for positioning which engages with some lifters was established in the inferior surface of tongue of a cartridge body according to this invention as stated above A lifter is minded. It not only can load the position of a cartridge loading member with this ink cartridge body normally, but Even when the thickness of an ink cartridge body is thinly formed to a limit that capacity of ink should be made [ many / as possible ] A crosswise secondary cross-section multiplier can be enlarged by this crevice, and that part reinforcement can be raised. Further Even when the hole of this part of the porous matter is made small by the part projected to the inner direction, a meniscus is made with size and the remainder becomes small, the remaining ink is collected near the ink feed hopper, it can remain and this can be used that there is nothing.

[0029] Moreover, while, establishing the interior of a proposal which extends in the sense parallel to the ink supply needle of a recording head in the 1 side of a cartridge loading member on the other hand Since the lifter member which supports the part of the ink feed hopper approach of a cartridge is made to meet the interior of a proposal by the switching operation of a lid and was made to carry out a variation rate Equip immediately or it makes it possible to make it break away. only by making a lid open and close, the ink cartridge which carried out engagement support is met on a lifter member at an ink supply needle -- making -- \*\* -- When an ink cartridge is inserted in the reverse sense, engagement to a supporter can be made into impossible and a user can be made it not only can to suppress breakage of an ink supply needle beforehand, but to detect unusual insertion immediately by making switching operation of a lid into impossible.

[0030] furthermore, not the side face of an ink cartridge but the part of the ink feed hopper approach of a pars basilaris ossis occipitalis -- supporting -- insertion and balking -- \*\*\*\*\* -- since it was made like, while making the overhang part from a cartridge side face with needlessness and enlarging the hold volume of the part ink, a carriage loading member, i.e., the cross direction dimension of carriage, can be made small, and the miniaturization of the printer itself can also be attained.

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## TECHNICAL FIELD

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[Field of the Invention] This invention relates to the ink cartridge which has the description to the loading nature to the ink jet printer of a serial type, and its feeder style.

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## PRIOR ART

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[Description of the Prior Art] The loading nature to carriage is [ how ] scrupulous, and there is no ink cartridge used for the ink jet printer of a serial type, and it may make an ink feed hopper have to agree correctly in the ink supply needle which projects from the tooth back of a recording head.

[0003] By carrying out rotation actuation of the lever, making the engagement projection projected to the medial surface engage with the engagement slot of an ink cartridge side face, this is turned to a recording head and the feeder style of the carriage which the basis of such a technical problem was shown at JP,7-32049,Y pushes it in.

[0004] However, at such feeder guard, on the relation which an engagement projection rotates to the circumference of the supporting point with a lever, as a result of the component of a force of a recording head and the right-angled sense acting on an ink cartridge by friction with an engagement projection, un-arranging of making this supply needle projected at the recording head tooth back according to this component of a force break arises.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] As stated above, in this invention, the crevice for positioning which engages with some lifters was established in the inferior surface of tongue of a cartridge body. A lifter is minded. Therefore, it not only can load the position of a cartridge loading member with this ink cartridge body normally, but Even when the thickness of an ink cartridge body is thinly formed to a limit that capacity of ink should be made [ many / as possible ] A crosswise secondary cross-section multiplier can be enlarged by this crevice, and that part reinforcement can be raised. Further Even when the hole of this part of the porous matter is made small by the part projected to the inner direction, a meniscus is made with size and the remainder becomes small, the remaining ink is collected near the ink feed hopper, it can remain and this can be used that there is nothing.

[0029] Moreover, it is while, establishing the interior of a proposal which extends in the sense parallel to the ink supply needle of a recording head in the 1 side of a cartridge loading member on the other hand, Since the lifter member which supports the part of the ink feed hopper approach of a cartridge is made to meet the interior of a proposal by the switching operation of a lid and was made to carry out a variation rate Equip immediately or it makes it possible to make it break away. only by making a lid open and close, the ink cartridge which carried out engagement support is met on a lifter member at an ink supply needle -- making -- \*\* -- When an ink cartridge is inserted in the reverse sense, engagement to a supporter can be made into impossible and a user can be made it not only can to suppress breakage of an ink supply needle beforehand, but to detect unusual insertion immediately by making switching operation of a lid into impossible.

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cross direction dimension of carriage, can be made small, and the miniaturization of the printer itself can also be attained.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] This invention was made in view of such a problem, and the place made into the purpose is to offer the new ink cartridge which can make the sense parallel to the axial center of an ink supply needle insert [ ink cartridge ] correctly on the occasion of \*\*\*\*, and its feeder style.

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## MEANS

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[Means for Solving the Problem] namely, this invention as an ink cartridge for attaining such a technical problem The crevice combined with a part of lifter member is put side by side on the inferior surface of tongue of an ink cartridge body with an ink feed hopper. As a feeder style of this ink cartridge While establishing the interior of a proposal which extends in the sense parallel to the axial center of an ink supply needle in the inside 1 side of the cartridge loading member which made the recording head and the ink supply needle open for free passage protrude on the inner back The lifter member which is guided inside a proposal and displaces the free end to the lid attached in opening of a cartridge loading member in good rotation is supported pivotably. \*\*\*\* which engages with the crevice established in the inferior surface of tongue of an ink cartridge, and supports an ink cartridge is prepared in the free edge of this lifter member.

[0007]

[Embodiment of the Invention] Then, the example of this invention is explained below. Drawing 1 thru/or drawing 3 show one example of this invention about the feeder style which loads the carriage for color printers with an ink cartridge.

[0008] In drawing, a sign 1 is the carriage which served as the loading member of the ink cartridge shows around at a guide rod 2 and it runs to a scanning direction. This carriage 1 It is constituted so that it can load with two ink cartridges, the object for black ink, and the object for color ink. Where the ink supply needle 19 is made to project to the inner direction, the recording head 18 is attached in the inner inner side 3 of these cartridge loading sections, i.e., the insertion-and-detachment opening 4 of an ink cartridge 20 and the field of the opposite side, free [ adjustment ].

[0009] By \*\*\*\*\* 6a which the guide slot 6 which shows this carriage 1 to the lower limit of the lifter 15 later mentioned on the side face of each insertion-and-detachment opening 4 is formed, and was formed in that upper limit While enabling it to hold a lid 10 to an open position through a lifter 15, it is constituted so that an ink cartridge 20 may be turned to a recording head 18 and you may make it go up and down perpendicularly by vertical section 6b of the sense parallel to the axial center of the ink supply needle 19 formed in half the bottom.

[0010] The lid 10 which rotates the supporting-point pin 11 as a core to the upper limit of the guide rod 2 approach of the insertion-and-detachment opening 4 is supported pivotably by this carriage 1, and by making the piece 12 of a pawl of the shape of a cross section of U characters formed in this free edge in one engage and release the stop section 5 prepared in the side besides

the carriage insertion-and-detachment opening 4, it is constituted so that a lid 10 may be opened and closed.

[0011] The piece 13 of cartridge press of the shape of a support-at-one-end stain formed by leaving one side by the side of the supporting-point pin 11 to this lid 10, and separating other three sides from a lid 10 to it is formed in one. By pressing against the top face of an ink cartridge 20 the free edge 13a projected downward where a lid 1 is stopped It is constituted so that it can keep putting the ink supply needle 19 by the side of a recording head 18 to the ink feed hopper 21 prepared in the inferior surface of tongue 22 of a cartridge 20.

[0012] Moreover, it is supported pivotably free [ rotation of the end face of a lifter 15 ] by the part which approached free one end a little rather than the supporting-point pin 11 at this lid 10. moreover, the projected part 16 which protruded on the other end of this lifter 15 being constituted so that it may slide on the inside of the guide slot 6 mentioned above, and, where a lid 10 is opened wide until full Where it stopped the lid 10 in the location by \*\*\*\*\* 6a of guide slot 6 upper limit and a lid 10 is rotated to the location in front of a closedown It is constituted by vertical section 6b of the sense parallel to the direction of an axial center of the ink supply needle 19 so that the ink cartridge 20 on a lifter 15 may be perpendicularly dropped to up to a recording head 18.

[0013] In addition, the signs 7 and 7 in drawing show the lever for include-angle adjustment which carries out rotation adjustment to the circumference of the supporting point which does not illustrate each recording head 18 of a color and black, and the sign 8 shows the lever for nozzle justification which justifies the recording head of a color in the direction of paper feed on the basis of the black recording head 18.

[0014] Drawing 4 thru/or drawing 6 are what showed the ink cartridge with which this carriage 1 is equipped. By the way, this ink cartridge 20 In order to compensate the reinforcement, while it is formed as a container of closing in of synthetic-resin material so that as many ink as possible can be held, and forming the opening edge 23 thickly While projecting to the up-and-down sense, forming a rib 25 in the corner of the lateral surface and planning the \*\* form of the depth direction, it is constituted so that friction in the case of wearing may be made small.

[0015] The ink feed hopper 21 is projected and formed in the longitudinal direction end of that inferior surface of tongue 22, and by thrusting the ink supply needle 6 into the film which is closing that end face, it is constituted by this ink cartridge 20 so that a free passage with the ink feed hopper 21 and a recording head 5 may be aimed at.

[0016] In the inferior surface of tongue 22 of this ink cartridge 20 Only by the crevice 24 which makes the groove of the die length which reaches a both-sides side into the part which \*\*\*\*(ed) to that ink feed hopper 21 side being formed, and dropping this ink cartridge 20 into the insertion-and-detachment opening 4 The secondary cross-section multiplier of an inferior surface of tongue 22 is made with size by forming this crevice 24 so that engagement to \*\*\*\* 16 of a rib 15 can be aimed at. When it is constituted so that the reinforcement of the cross direction of an ink cartridge 20 may be raised more, and also this ink cartridge 20 is vacuum-packed, as shown in drawing 6 by making the packing material 26 enter until elasticity limit full in a crevice 24 Even when air enters the interior, as the two-dot chain line showed, it should be constituted so that the buffer ability which can maintain internal negative pressure as much as possible according to the force of the packing material 26 which it is going to restore out of a crevice 24 may be given.

[0017] Moreover, by on the other hand, forming so that this crevice 24 may be made to project inside an ink cartridge 20 It cooperates with the rib 28 of lid 27 inside which formed the ink feed

hopper 21 side highly. The air bubbles of the porosity elastic material 29 enclosed with the interior are gradually made small to ink feed hopper 21 approach, the meniscus of this part is made greatly, when internal ink decreases in number, these is collected to the ink feed hopper 21 side, and it is constituted so that ink can all be used.

[0018] Thus, in the constituted example, in order to load carriage 1 with an ink cartridge 20 now, as shown in drawing 2 (a), a lid 10 is opened first, the projected part 16 of lifter 15 lower limit is stopped to \*\*\*\*\* 6a of the guide slot 6, a lid 10 is held to an open position, the sense is set that the ink feed hopper 21 faces the ink supply needle 19 on it, and an ink cartridge 20 is dropped into the insertion-and-detachment opening 4 of carriage 1.

[0019] Thereby, as shown in drawing 2 (b), the \*\*\*\*\* beam crevice 24 engages with the ink feed hopper 21 side at \*\*\*\* 17 of a lifter 15, and in the ink feed hopper 21, an ink cartridge 20 turns the heavier one of the opposite side down, and is held with the posture which inclined in the counterclockwise rotation in drawing.

[0020] When a lid 10 is shut in this condition, as shown in drawing 2 (c), and an ink cartridge 20 It descends to the interior, being led to insertion-and-detachment opening inside 4a of stop section 5 approach. Subsequently If the projected part 16 of lifter 15 lower limit reaches vertical section 6a of half the bottom of the guide slot 6 and \*\*\*\* 17 comes to descend perpendicularly, an ink cartridge 20 will change the posture into the level sense gradually, using the inside 4a upper limit by the side of the stop section as the supporting point.

[0021] And finally, if the projected part 16 of lifter 15 lower limit approaches the lower limit of the guide slot 6, as shown in drawing 2 (d) A cartridge 20 is dropped the piece 13 of a spring of the shape of a cantilever prepared in the lid 10 pressing a top face from a top by the point 13a. Penetrating of this is carried out to the ink feed hopper 21, tearing a film with the ink supply needle 19 located in right under [ the ], and the free passage unification of a recording head 18 and the ink cartridge 20 is carried out.

[0022] On the other hand, when the ink in an ink cartridge 20 needs to be lost by long-term record writing and the new ink cartridge 20 needs to be exchanged, the piece 12 of a pawl is pushed and a lid 10 is removed from the stop section 5.

[0023] Thereby, since the lid 10 has bounded upwards by the spring nature which the piece 13 of a spring has, if this is opened further, the projected part 16 guided at vertical section 6b of the guide slot 6 pushes up an ink cartridge 20 right above with a posture as it is with a lifter 15, it will make it secede from the ink feed hopper 21 after this, without making the ink supply needle 19 break, and will make drawing of an ink cartridge 20 possible.

[0024] Therefore, after raising an ink cartridge 20 also as that of the insertion-and-detachment opening 4 through the reverse of the actuation mentioned above to (a) from (c) of drawing 2 , it inserts and takes out henceforth with a finger.

[0025] On the other hand, since an ink cartridge 20 is \*\*\*\*\* (ed) while the ink cartridge 20 has been in the condition that a crevice 24 does not engage with \*\*\*\* 17 of a lifter 10 as it was shown in drawing 3 sense [ reverse ], i.e., when dropped with the posture in which the ink feed hopper 21 and the ink supply needle 19 do not face each other, the ink feed hopper 21 will touch base 4b first.

[0026] However, a user makes this unusual loading condition immediately known in this condition, without being interfered at this top face, it becoming impossible for a lid 10 to stop above, and press of an ink cartridge 20 also serving as impossible at coincidence, and producing breakage of the ink supply needle 19 by impossible press fit, since the top face of an ink cartridge 20 has still projected above the insertion-and-detachment opening 4.

[0027] By the way, although the example about the ink cartridge with which the carriage for color printers is loaded, and its feeder style explains this invention, to say nothing of this invention being applicable also to the printer for monochrome, the above can load the 1 side of the body of a printer, or both sides with an ink cartridge, and can install, and can apply this invention to the printer of a format.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view of the carriage equipped with the cartridge feeder style which makes one example of this invention.

[Drawing 2] (a) Or (d) is the explanatory view having shown loading actuation of an ink cartridge in order.

[Drawing 3] It is drawing having shown the condition of having loaded the reverse sense.

[Drawing 4] It is the perspective view having shown one example of the ink cartridge with which it is loaded by this feeder style.

[Drawing 5] It is drawing having shown the cross section of a cartridge same as the above.

[Drawing 6] It is drawing having shown a part of cartridge same as the above in the condition of having packed.

[Description of Notations]

1 Carriage

4 Loading Opening

6 Guide Slot

10 Lid

13 Piece of Spring

15 Lifter

17 \*\*\*\*

18 Recording Head

19 Ink Supply Needle

20 Ink Cartridge

21 Ink Feed Hopper

24 Crevice

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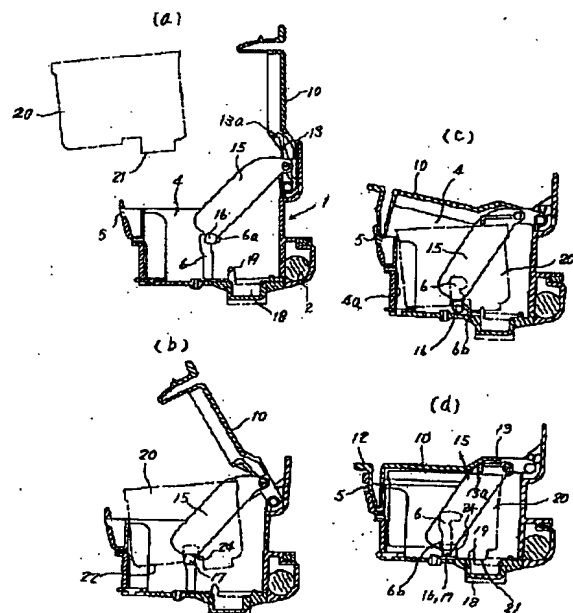
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(54)【発明の名称】 インクカートリッジとその装填機構

(57)【要約】 (修正有)

【課題】 カートリッジ装填部材に正しく装脱することのできるインクカートリッジ20と、その装填機構を供給すること。

【解決手段】 インクカートリッジ20の下面に設けた凹部24に支杆17に係合させた上、インク供給針19の軸心と平行な向きのガイド溝6によってリフタ15を案内しつつ蓋体10を閉止してゆくことにより、インクカートリッジ20を記録ヘッド18に向けて正しく降下させて、インク供給針19を損傷させることなくこれを正しく装着させるようにしたもの。



**【特許請求の範囲】**

【請求項 1】 インクカートリッジ本体の下面に、リフタ部材の一部と結合する凹部をインク供給口とともに併設したことを特徴とするインクカートリッジ。

【請求項 2】 上記凹部を、上記インクカートリッジ本体の両側面に達する長さに形成したことを特徴とする請求項 1 記載のインクカートリッジ。

【請求項 3】 上記凹部を、インクカートリッジ本体の内側に突出するように形成したことを特徴とする請求項 1 記載のインクカートリッジ。

【請求項 4】 内奥に記録ヘッドと連通するインク供給針を突設させたカートリッジ装填部材の内面一侧に、上記インク供給針の軸心と平行な向きに延びる案内部を設けるとともに、上記カートリッジ装填部材の開口部に可回動的に取り付けた蓋体に、自由端を上記案内部に案内されて変位するリフタ部材を枢支し、該リフタ部材の自由端部に、インクカートリッジの下面に設けた凹部と係合して該インクカートリッジを支持する支杆を設けたことを特徴とするインクカートリッジの装填機構。

【請求項 5】 上記蓋体の内面に、閉止直前において上記インクカートリッジの頂面と当接して該インクカートリッジの下面に設けたインク供給口を上記インク供給針に向けて押圧する押圧部を弾性変形可能に設けたことを特徴とする請求項 4 記載のインクカートリッジの装填機構。

**【発明の詳細な説明】****【0001】**

【発明の属する技術分野】 本発明は、シリアルタイプのインクジェットプリンタへの装填性に特徴を有するインクカートリッジとその装填機構に関する。

**【0002】**

【従来の技術】 シリアルタイプのインクジェットプリンタに使用するインクカートリッジは、キャリッジへの装填性の如何に拘りなく、記録ヘッドの背面から突出するインク供給針にインク供給口を正しく合致させ得るものでなければならない。

【0003】 このような課題のもとに実公平 7-32049 号公報に提示されたキャリッジの装填機構は、レバーを回動操作することによって、その内側面に突出した係合突起をインクカートリッジ側面の係合溝に係合させつつこれを記録ヘッドに向けて押込むようにしたものである。

【0004】 ところが、このような装填機構では、係合突起がレバーとともに支点回りに回動する関係上、係合突起との摩擦によりインクカートリッジに記録ヘッドと直角な向きの分力が作用する結果、この分力により記録ヘッド背面に突出したこの供給針を折損させかねないといった不都合が生じる。

**【0005】**

【発明が解決しようとする課題】 本発明はこのような問

題に鑑みてなされたもので、その目的とするところは、装脱に際してインクカートリッジをインク供給針の軸心と平行な向きに正しく挿脱させることのできる新たなインクカートリッジとその装填機構を提供することにある。

**【0006】**

【課題を解決するための手段】 すなわち、本発明はこのような課題を達成するためのインクカートリッジとして、インクカートリッジ本体の下面に、リフタ部材の一部と結合する凹部をインク供給口とともに併設するようにしたものであり、また、このインクカートリッジの装填機構として、内奥に記録ヘッドと連通するインク供給針を突設させたカートリッジ装填部材の内面一侧に、インク供給針の軸心と平行な向きに延びる案内部を設けるとともに、カートリッジ装填部材の開口部に可回動的に取り付けた蓋体に、自由端を案内部に案内されて変位するリフタ部材を枢支し、このリフタ部材の自由端部に、インクカートリッジの下面に設けた凹部と係合してインクカートリッジを支持する支杆を設けるようにしたものである。

**【0007】**

【発明の実施の形態】 そこで以下に本発明の実施例について説明する。図 1 乃至図 3 は、カラープリンタ用のキャリッジにインクカートリッジを装填するその装填機構についての本発明の一実施例を示したものである。

【0008】 図において符号 1 は、ガイドロッド 2 に案内されて走査方向に走行するインクカートリッジの装填部材を兼ねたキャリッジで、このキャリッジ 1 は、黒インク用とカラーインク用の 2 つのインクカートリッジを装填し得るように構成されていて、これらのカートリッジ装填部の内奥面 3、つまりインクカートリッジ 20 の挿脱口 4 と反対側の面には、インク供給針 19 を内方に突出させた状態で記録ヘッド 18 が調整自在に取付けられている。

【0009】 このキャリッジ 1 には、各挿脱口 4 の側面に後述するリフタ 15 の下端を案内するガイド溝 6 が設けられていて、その上端に形成した鍵型部 6a により、リフタ 15 を介して蓋体 10 を開放位置に保持できるようにするとともに、下半に形成したインク供給針 19 の軸心と平行な向きの垂直部 6b により、インクカートリッジ 20 を記録ヘッド 18 に向けて垂直に昇降させ得るように構成されている。

【0010】 このキャリッジ 1 には、挿脱口 4 のガイドロッド 2 寄りの上端に、支点ピン 11 を中心として回動する蓋体 10 が枢支されていて、この自由端部に一体的に形成した断面 U 字状の爪片 12 をキャリッジ挿脱口 4 の他側に設けた係止部 5 に係脱させることによって蓋体 10 を開閉するように構成されている。

【0011】 この蓋体 10 には、支点ピン 11 側の一辺を残して他の 3 辺を蓋体 10 から切り離すことにより形

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成した片持梁状のカートリッジ押圧片 13 が一体的に設けられていて、蓋体 1 を閉止した状態で下向きに突出したその自由端部 13a をインクカートリッジ 20 の頂面に押し当てることによって、カートリッジ 20 の下面 22 に設けたインク供給口 21 に記録ヘッド 18 側のインク供給針 19 を差し通すことができるように構成されている。

【0012】またこの蓋体 10 には、支点ピン 11 よりも若干自由端側に寄った部分にリフタ 15 の基端が回動自在に枢支され、また、このリフタ 15 の他端に突設した突部 16 は上述したガイド溝 6 内を摺動するように構成されていて、蓋体 10 を一杯まで開放した状態では、ガイド溝 6 上端の鍵型部 6a によって蓋体 10 をその位置に係止し、また、蓋体 10 を閉止直前の位置まで回動させた状態では、インク供給針 19 の軸心方向と平行な向きの垂直部 6b により、リフタ 15 上のインクカートリッジ 20 を記録ヘッド 18 の上へ垂直に降下させ得るように構成されている。

【0013】なお、図中符号 7、7 はカラー及び黒の各記録ヘッド 18 を図示しない支点回りに回動調整する角度調整用のレバーを示しており、また符号 8 は、黒の記録ヘッド 18 を基準としてカラーの記録ヘッドを紙送り方向に位置調整するノズル位置調整用のレバーを示している。

【0014】ところで、図 4 乃至図 6 はこのキャリッジ 1 に装着するインクカートリッジを示したもので、このインクカートリッジ 20 は、インクを可能な限り多く収容することができるよう合成樹脂材により肉薄の容器として形成され、その強度を補うために開口縁 23 を肉厚に形成するとともに、外側面の角部にはリブ 25 を上下

の向きに突出形成して深さ方向の保形を図るとともに、装着の際の摩擦を小さくするように構成されている。

【0015】このインクカートリッジ 20 には、その下面 22 の長手方向一端にインク供給口 21 が突出形成され、その端面を封止しているフィルムにインク供給針 6 を突き通すことによって、インク供給口 21 と記録ヘッド 5 との連通を図るように構成されている。

【0016】このインクカートリッジ 20 の下面 22 には、そのインク供給口 21 側に偏寄した部分に、両側面に達する長さの溝状をなす凹部 24 が形成されていて、このインクカートリッジ 20 を挿脱口 4 に落とし込むだけで、リブ 15 の支杆 16 との係合が図れるように、かつ、この凹部 24 を設けることにより下面 22 の断面 2 次係数を大となして、インクカートリッジ 20 の巾方向の強度をより高めるように構成され、またさらに、このインクカートリッジ 20 を真空包装した際に、図 6 に示したように、その包装材 26 を凹部 24 内に弾性限界一杯まで入り込ませておくことにより、万一、内部に空気が入り込んだ場合でも、2 点鎖線で示したように、凹部 24 内から復元しようとする包装材 26 の力により内部

の負圧を可能な限り保つことができるようなバフア機能を持たせるように構成されている。

【0017】また一方、この凹部 24 をインクカートリッジ 20 の内部に突出させるように形成することにより、インク供給口 21 側を高く形成した蓋 27 内面のリブ 28 と協同して、内部に封入した多孔質弾性材 29 の気泡をインク供給口 21 寄りへと徐々に小さくし、この部分のメニスカスを大きくなして、内部のインクが減少した際にこれをインク供給口 21 側へ集めて、インクを残らず使用することができるように構成されている。

【0018】このように構成された実施例において、いま、インクカートリッジ 20 をキャリッジ 1 に装填するには、図 2 (a) に示したように、はじめに蓋体 10 を開いてリフタ 15 下端の突部 16 をガイド溝 6 の鍵型部 6a に係止して蓋体 10 を全開位置に保持し、その上で、インク供給口 21 がインク供給針 19 と向い合うように向きを定めてインクカートリッジ 20 をキャリッジ 1 の挿脱口 4 に落とし込む。

【0019】これにより、インクカートリッジ 20 は、図 2 (b) に示したように、インク供給口 21 側に偏寄せ設けた凹部 24 がリフタ 15 の支杆 17 に係合し、インク供給口 21 とは反対側の重い方を下にして、図中反時計方向に傾斜した姿勢のまま保持される。

【0020】そして、この状態で蓋体 10 を閉めてゆくと、図 2 (c) に示したように、インクカートリッジ 20 は、係止部 5 寄りの挿脱口内面 4a に導かれながら内部に下降してゆき、ついで、リフタ 15 下端の突部 16 がガイド溝 6 下半の垂直部 6a に達して支杆 17 が垂直に下降してゆくようになると、インクカートリッジ 20 は係止部側の内面 4a 上端を支点としつつその姿勢を徐々に水平な向きに変えてゆく。

【0021】そして最後に、リフタ 15 下端の突部 16 がガイド溝 6 の下端に近づくと、図 2 (d) に示したように、蓋体 10 に設けた片持梁状のバネ片 13 がその先端部 13a で頂面を上から押圧しつつカートリッジ 20 を下降させ、その真下に位置するインク供給針 19 によってフィルムを破りつつこれをインク供給口 21 に貫入させて、記録ヘッド 18 とインクカートリッジ 20 とを連通一体化させる。

【0022】一方、長期の記録書込みによりインクカートリッジ 20 内のインクがなくなって新たなインクカートリッジ 20 を交換する必要がある場合には、爪片 12 を押して蓋体 10 を係止部 5 から外す。

【0023】これにより、蓋体 10 はバネ片 13 の持つバネ性により上方へ跳ね上げられるから、これをさらに開いてゆくと、ガイド溝 6 の垂直部 6b に案内された突部 16 は、リフタ 15 とともにインクカートリッジ 20 をそのままの姿勢で真上に押上げ、インク供給針 19 を折損させることなくインク供給口 21 をこれから離脱させて、インクカートリッジ 20 の取出しを可能にする。

【0024】したがって、以後は、図2の(c)から(a)へと上述した動作の逆を経てインクカートリッジ20を挿脱口4のもと上昇させた上、指で挟んで取出す。

【0025】これに対して、インクカートリッジ20が逆向きに、つまりインク供給口21とインク供給針19が向き合わないような姿勢で落とし込まれた場合には、図3に示したように、凹部24がリフタ10の支杆17と係合しない状態のままインクカートリッジ20が引降ろされるため、はじめにインク供給口21が底面4bに接することになる。

【0026】ところが、この状態ではインクカートリッジ20の頂面が未だ挿脱口4の上方に突出しているため、蓋体10がこの頂面に邪魔されてこれ以上閉止することができなくなり、同時にインクカートリッジ20の押圧も不能となって、無理な圧入によるインク供給針19の折損を生じさせることなく、この異常な装填状態を直ちに使用者に判らせる。

【0027】ところで、以上は、カラープリンタ用のキャリッジに装填するインクカートリッジとその装填機構についての例によって本発明を説明したものであるが、モノクロ用のプリンタにも本発明を適用することができることは言うまでもなく、また、インクカートリッジをプリンタ本体の一側もしくは両側に装填する据え付け形式のプリンタにも本発明を適用することができる。

#### 【0028】

【発明の効果】以上述べたように本発明によれば、カートリッジ本体の下面にリフタの一部と係合する位置決め用の凹部を設けたので、リフタを介してこのインクカートリッジ本体をカートリッジ装填部材の所定の位置に正常に装填することができるばかりでなく、インクの収容量を可能な限り多くすべくインクカートリッジ本体の肉厚を限度まで薄く形成した場合でも、この凹部により幅方向の断面2次係数を大きくしてその分強度を高めることができ、さらには、内方に突出した部分により多孔性物質のこの部分の孔を小さくし、メニスカスを大となして、残りが僅かとなった場合でも残りのインクをインク供給口の近くに集めてこれを残りに使用することができる。

【0029】また一方、カートリッジ装填部材の一側に、記録ヘッドのインク供給針と平行な向きに延びる案

内部を設けるとともに、カートリッジのインク供給口寄りの部分を支持するリフタ部材を、蓋体の開閉操作により案内部に沿わせて変位させるようにしたので、蓋体を単に開閉させるだけで、リフタ部材上に係合支持したインクカートリッジをインク供給針に沿わせて真すぐに装着し、あるいは離脱させることを可能として、インク供給針の破損を未然に抑えることができるばかりでなく、インクカートリッジを逆向きに挿入した場合には、支持部との係合を不能とし蓋体の開閉操作を不能として、異常な挿入を使用者に直ちに検知させることができる。

【0030】またさらに、インクカートリッジの側面ではなく、底部のインク供給口寄りの部分を支持して挿入と離脱を行わすようにしたので、カートリッジ側面からの張出し部分を不要となしてその分インクの収容容積を大きくするとともに、キャリッジ装填部材、つまりキャリッジの巾方向寸法を小さくして、プリンタ自体の小型化をも図ってゆくことができる。

#### 【図面の簡単な説明】

【図1】本発明の一実施例をなすカートリッジ装填機構を備えたキャリッジの斜視図である。

【図2】(a)乃至(d)はインクカートリッジの装填動作を順に示した説明図である。

【図3】逆向きに装填した状態を示した図である。

【図4】この装填機構により装填されるインクカートリッジの一実施例を示した斜視図である。

【図5】同上カートリッジの断面を示した図である。

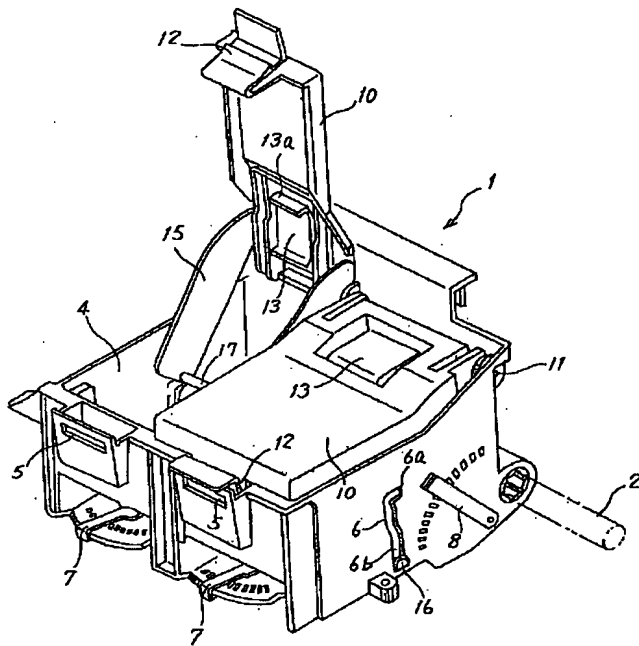
【図6】バックした状態での同上カートリッジの一部を示した図である。

#### 【符号の説明】

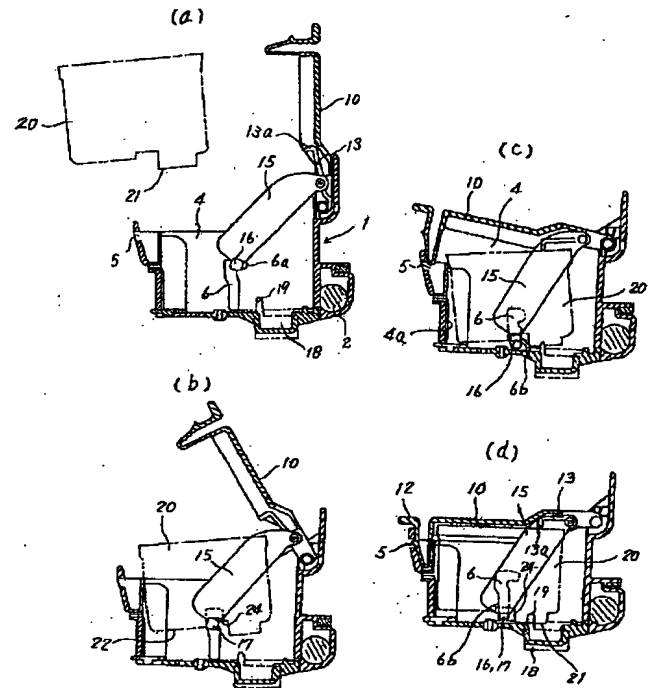
- 1 キャリッジ
- 4 装填口
- 6 ガイド溝
- 10 蓋体
- 13 パネ片
- 15 リフタ
- 17 支杆
- 18 記録ヘッド
- 19 インク供給針
- 20 インクカートリッジ
- 21 インク供給口
- 24 凹部



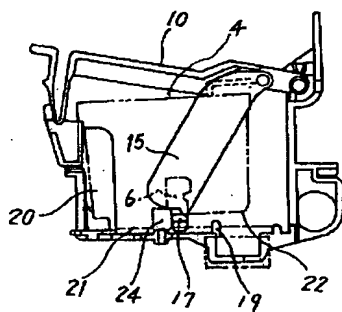
【図 1】



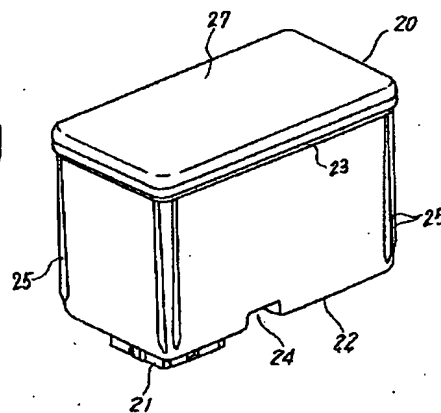
【図 2】



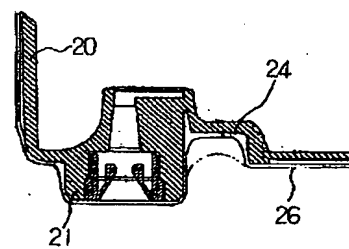
【図 3】



【図 4】



【図 6】



【図 5】

